

Interactive comment on “Soil moisture-runoff relation at the catchment scale as observed with coarse resolution microwave remote sensing” by K. Scipal et al.

K. Scipal et al.

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Comments #3: We agree that our conclusions might be too optimistic. The climate of the study area with its clear seasonal dynamic has a positive impact on the observed correlations. In temperate climates these relations might be weaker. We will modify the conclusions respectively.

Comment #4: The problem of the Kalabo station is mainly that it shows no flow for three years and very low flow for all other years except for the year 2000 with abnormal high flows. This extreme behaviour leads to an ill posed fitting of the described model. We agree to the referee that this has to be discussed more properly and we will include a more comprehensive discussion of the behaviour observed at the station Kalabo in the revised manuscript.

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The referee is correct, we mean intra-annual. This will be clarified in the revised manuscript

The mean annual cycle is the average taken for each decade over all years of the period 1992-2000. This will be clarified in the revised manuscript.

Comment #5: Being aware that the seasonal behaviour of the climate in the Zambezi catchment predetermines high correlations we have also analysed anomalies which are not prone to seasonal variations (see page 432 lines 10-25 and figure 7 and 8). Anomalies have been calculated by removing the seasonal cycle. Fig. 7 and Fig. 8 show scatterplots of the anomalies. Clearly one can observe a correlation between the datasets. Years with positive anomalies, i.e. high flow years, also show positive soil moisture anomalies. Years with negative anomalies, i.e. low flow years show negative soil moisture anomalies. The correlation is obviously weaker compared to the correlations of the absolute values. Also evident is the influence of the dry season. In the dry season the flow is generally low and there is no variation from year to year (all measurements line up on the 0 line in the anomalies plot). Because these measurements are dominating we abstained from calculating a correlation coefficient and limited the discussion to visual interpretation of the results. To further clarify this issue we will also calculate the R2 statistics separately for dry and wet seasons as suggested by the referee.

Comment #6: Different time shifts have been applied and are listed in table 2 and table 3. This will be clarified in the revised manuscript; a residual plot will be added.

Comment #9: The comment will be considered in the revised version.

Comment #12: The comment will be considered in the revised version.

Comment #13: Fig. 2 and Fig 3 will be modified.

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